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Enterprise Integrated Safety Management (EISM) within the DOE: How an Enterprise Application helps Transform an Organization

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Michael Baghoomian
801-774-3007
Michael.baghoomian@ngc.com

Agenda

- Vision of Enterprise Information for ISM

- Immediate Benefits and Business Drivers

- Other Customers – Case Studies

- How Do We Get There

- Build the Business Case

- EISM Example

Enterprise Integrated Safety Management (EISM) Vision

Transparency to All ISM Related Information
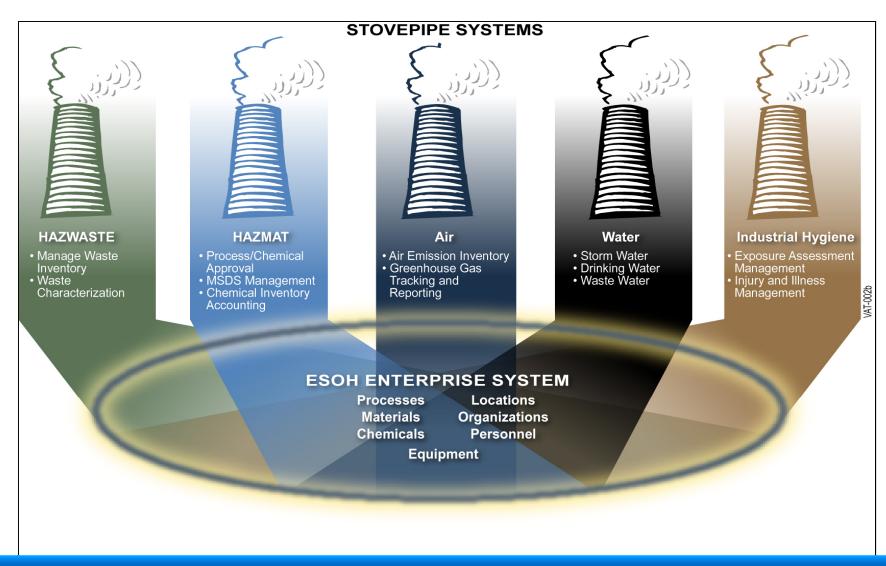**Leading Indicators to Drive Improvement**

What is ISM

- ## Solution - An integrated EH&S ISM platform
  - A web-based integrated solution for tracking, evaluating and controlling employee health hazards throughout an employee's DOE/NNSA career.
    - Provide DOE and contractor EH&S professionals, operational managers and supervisors with "real-time" data so that they may apply immediate options for reducing safety and health threats.
    - Provide employees with "real-time" EH&S data regarding their work environment and authorized work tasks.
    - Provide a consistent approach to work control that will reduce error-likely situations.
    - Provide integrated information management system for IH, Chemical Management, Safety, Fire Protection, Emergency Management, Environment and Occupational Medicine.
    - Provide an electronic format for employee medical records

Where Are We Today

STOVEPIPE SYSTEMS

HAZWASTE
- Manage Waste Inventory
- Waste Characterization

HAZMAT
- Process/Chemical Approval
- MSDS Management
- Chemical Inventory Accounting

Air
- Air Emission Inventory
- Greenhouse Gas Tracking and Reporting

Water
- Storm Water
- Drinking Water
- Waste Water

Industrial Hygiene
- Exposure Assessment Management
- Injury and Illness Management

ESOH ENTERPRISE SYSTEM

Processes   Locations
Materials   Organizations
Chemicals   Personnel

Equipment

VAT-002b

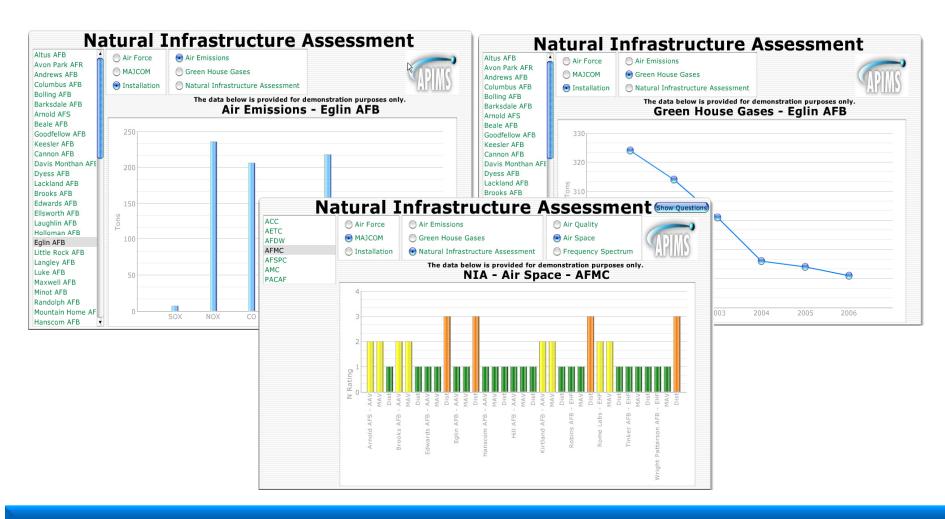## *Redundancy of Common Data Drives Expense and Error*

Business Benefits of Enterprise Information

- An integrated EH&S Enterprise platform will…
  - Reduce Costs
    - Eliminate Data Redundancy
    - Increase Data Quality and Transparency
  - Improve management & control of worker hazards, chemicals, waste, etc
    - Lower loss time/Increase Productivity
    - Happy, Healthy Workers and Community
  - Improve ISM performance
    - Hazard ID, Select and implement Controls, Perform Work Safely and Feedback and Improvement
    - Can act as the work authorization gate for approving work.
  - Improve CAS/LOCAS
    - Enable Sites to consistently track and manage both lagging and leading indicators for assurance of contractor ISM programs.
  - Standardize EH&S tracking and reporting systems.
  - Enable Sites to fully comply with EH&S regulatory requirements
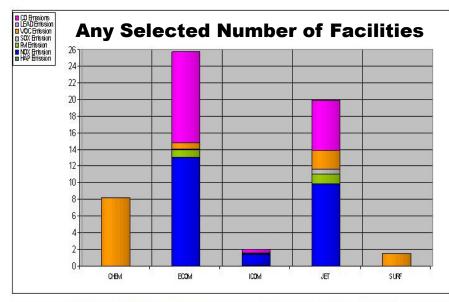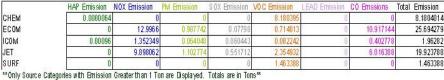
Corporate Reporting Metrics

Data – Information – Knowledge
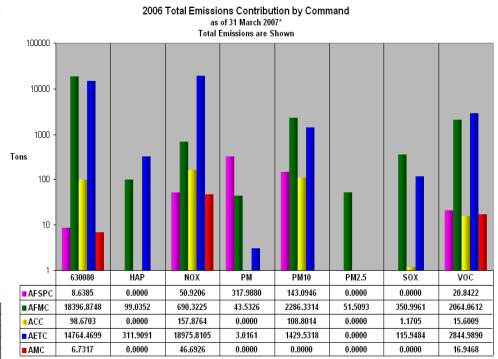### Redefine the Way We Do Business

Enterprise Visibility and Value

- **Benefits to Air Force and Major Commands**
  - **Multi-facility Cumulative Totals for Local/Regional/National Regulatory Negotiation**

Any Selected Number of Facilities

	HAP Emission	NOX Emission	PM Emission	SOX Emission	VOC Emission	LEAD Emission	CO Emissions	Total Emission
CHEM	0.0000064	0	0	0	8.180395	0	0	8.1804014
ECOM	0	12.9966	0.987742	0.07798	0.714813	0	10.917144	25.694279
ICOM	0.00096	1.352349	0.064048	0.060443	0.08242	0	0.402778	1.96282
JET	0	9.898062	1.102774	0.551712	2.354932	0	6.016308	19.923788
SURF	0	0	0	0	1.463388	0	0	1.463388

Only Source Categories with Emission Greater than 1 Ton are Displayed. Totals are in Tons

2006 Total Emissions Contribution by Command
as of 31 March 2007*
Total Emissions are Shown

	630080	HAP	NOX	PM	PM10	PM2.5	SOX	VOC
AFSPC	8.6385	0.0000	50.9206	317.9880	143.0946	0.0000	0.0000	20.8422
AFMC	18396.8748	99.0352	690.3225	43.5326	2286.3314	51.5093	350.9961	2064.0612
ACC	98.6703	0.0000	157.8764	0.0000	108.8014	0.0000	1.1705	15.6009
AETC	14764.4699	311.9091	18975.8105	3.0161	1429.5318	0.0000	115.9484	2844.9890
AMC	6.7317	0.0000	46.6926	0.0000	0.0000	0.0000	0.0000	16.9468

*Total emissions do not necessarily reflect "Actual" emissions reported for the time period, due to variations in the types of calculations performed at each facility.
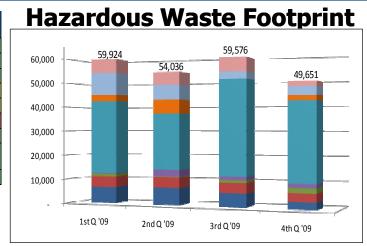
Knowledge Is a Powerful Negotiation Tool

Corporate Dashboards – Visibility into Savings that could never be realized

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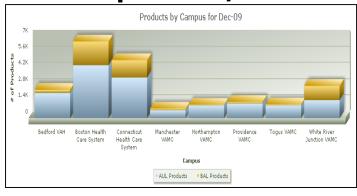
Bedford	BHS	CHS	Manchester	Northampton	Providence	Togus	White River Junction

Hazardous Materials

Values shown: Jul-09: 343,102; Aug-09: 374,596; Sep-09: 409,003; Oct-09: 518,218; Nov-09: 465,284; Dec-09: 425,693

HazMat % Change	Campus	HazWaste % Change
-24%	Togus VAMC	-55%
3%	White River Junction VAMC	-38%
-9%	Bedford VAH	-18%
-20%	Boston Health Care System	4%
-62%	Manchester VAMC	1%
0%	Northampton VAMC	88%
-23%	Providence VAMC	-15%
6%	Connecticut Health Care System	-51%
-9%	VISN	-11%

Legend:
- Connecticut Health Care System
- Providence VAMC
- Northampton VAMC
- Manchester VAMC
- Boston Health Care System
- Bedford VAMC
- White River Junction VAMC
- Togus VAMC

Hazardous Waste Footprint

Values shown: 1st Q '09: 59,924; 2nd Q '09: 54,036; 3rd Q '09: 59,576; 4th Q '09: 49,651

Hospital AUL/BAL

Products by Campus for Dec-09
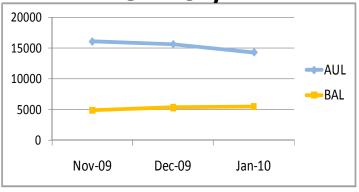
Greening

Campus	BAL / Total Products
Togus VAMC	0.07
White River Junction VAMC	0.44
Bedford VAH	0.11
Boston Health Care System	0.30
Manchester VAMC	0.17
Northampton VAMC	0.05
Providence VAMC	0.10
Connecticut Health Care System	0.30
VISN	0.28

VISN AUL/BAL

AUL / BAL values for Nov-09, Dec-09, Jan-10

HOW DO WE GET THERE??

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Process for Institutionalizing an Enterprise EH&S Application

- Identify Key Compliance Burdens

- Identify Key Barriers

- Develop methods to overcome barriers

- Identify what you want from an enterprise EH&S application

- Create a business case quantifying the cost/benefit of meeting business objectives.

- Establish a budget and ROI
  - Money, Money, Money

- Identify the best software solutions to enable meeting the business objectives within the established budget

Compliance Issues and Burdens

- Clean Air Act

- Chemical Tracking

- Hazardous Waste Tracking

- Employee Longitudinal Health Record

- Injury and Illness Tracking

- GHG Emissions

- Energy Consumption/Green IT

- Medical Surveillance and Records (EEOICPA)

- **Integrated Safety Management (ISM) – DOE**

Legally Required Cost Drivers

Regulatory Implications of ISM

- 10 CFR 851, Presidential Directive 5 NNSA is required to have in place a Longitudinal Exposure Record for each of its employees from the date the person entered the government service for 75 years from their departure from the department

- 10 CFR 851.21 requires documented Hazard Identification and Assessment Processes

- 10 CFR 851.22 requires documented Hazard Prevention and Abatement Processes

- 10 CFR 851 compliant Industrial Hygiene Programs must document results of baseline and periodic surveys to identify and evaluate potential worker health risks

- 10 CFR 851 requires electronic medical records

- EO 13514 Federal Leadership in Environmental, Energy, and Economic Performance

- Sites are reporting Non-compliance with 10 CFR 851 Hazard Analysis
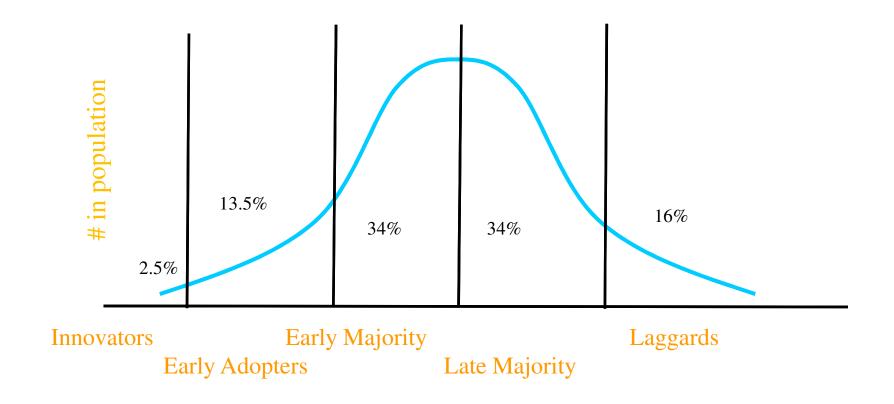
Legally Required Cost Drivers

Barriers to EH&S Integration

- Requirements to the institutionalization of Enterprise EH&S System
  - Management/Functional Support Commitment
  - Policy Guidance
  - Financial Incentive
  - Taxonomy between functional areas (Common Language)
  - Data Stewardship (Provide the Data)
  - Business Practice/Work Control (Common as possible)
  - Sustainable Measureable Improvement

- Barriers Hindering EH&S Integration
  - Empires/Funding
  - Trust/Respect
  - Crisis Management
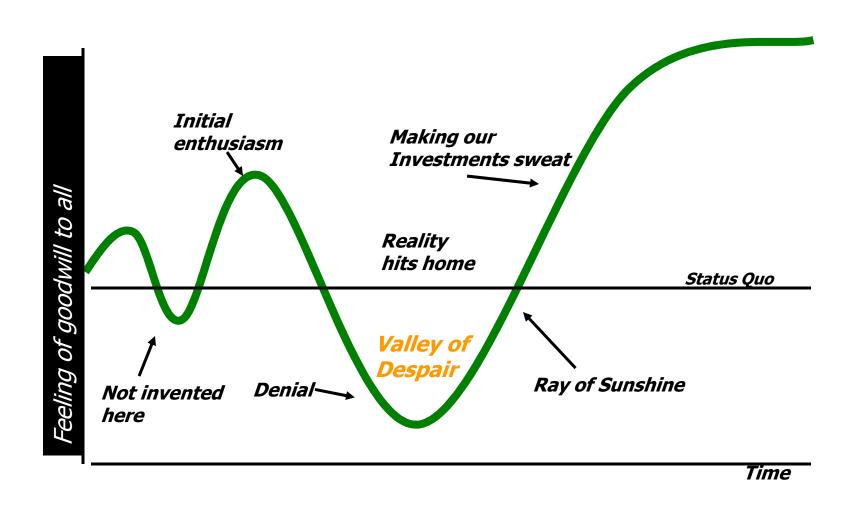 - Integration with other applications

Process for Adoption

Who is on Board?

HOW DO WE MAKE CHANGE HAPPEN??

Business Transformation Supporting EH&S Integration

Work Planning and Control

Facilities
Safety
Medical
Logistics
Environment
Shop Floor
Mission
Enterprise ESOH

Complex Transformation Founding Principles
- Agree On a Common Data Point
- Build On the Common Framework
- Share Data, Information, Knowledge
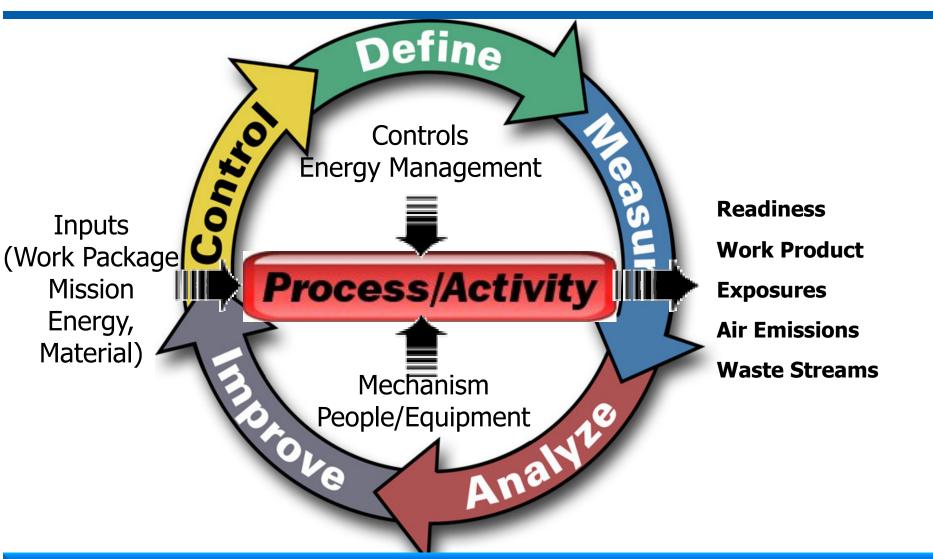- Use Stewarded Data Sets

Transformation Applied to EH&S
- Work Unit "Process" Lowest Common Denominator
- Driver to Define Process? "Chemical Authorization"
- Transform From "Material" to Process Centricity (EMS)
- Involve All ESOH Functions
- In "Process Authorization" Assign Stewardship to "ESOH Data Sets"

MSDS, Chemical Hazards, Transportation, Job Classing, Exposure Limits, Storage Limits, Controls……

Provide Data to the User vs. Making the User Enter

Deliver Value to the Empowered User
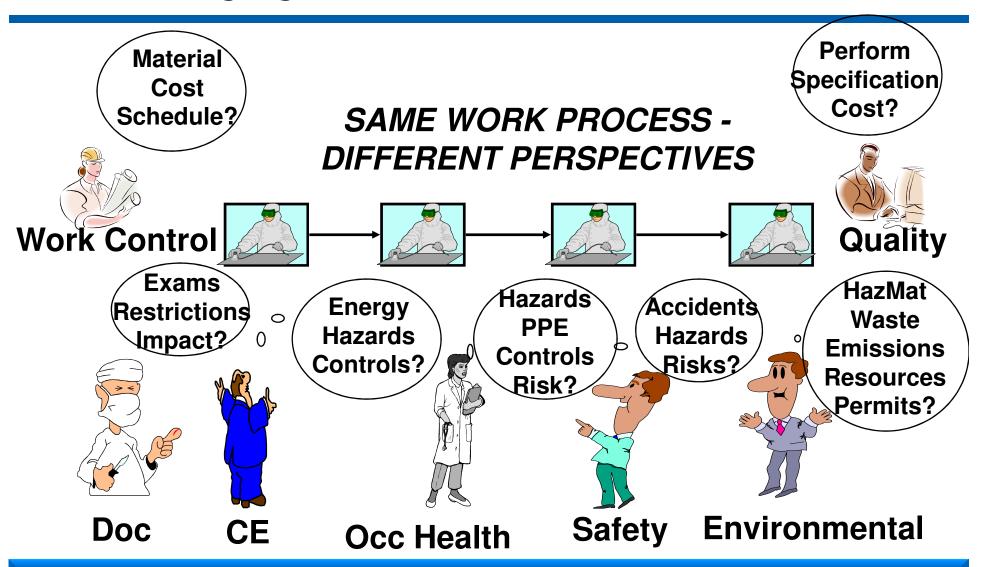
Using the Process Management Approach

Its All About the Business / Mission
Redefine the Way We Do Business
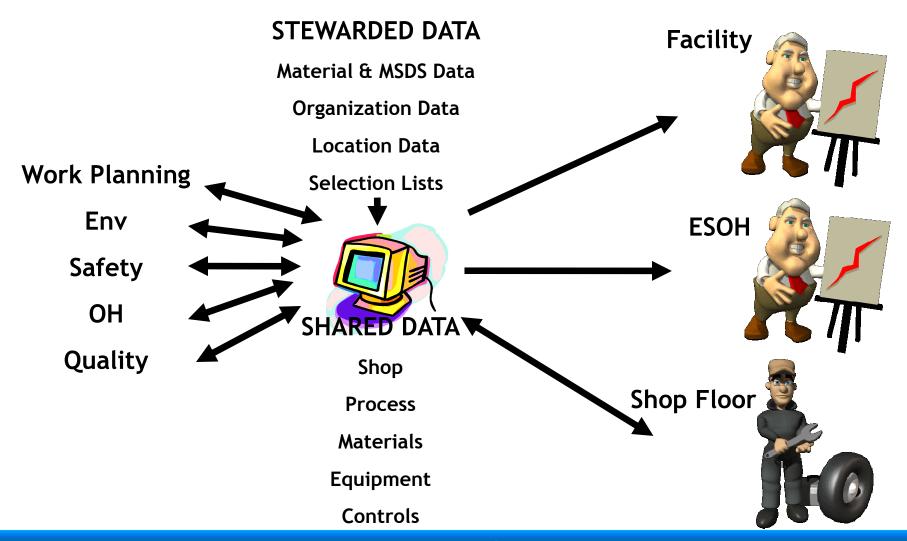
Taxonomy Between Functions
Common Language

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Material Cost Schedule?

Perform Specification Cost?

SAME WORK PROCESS - DIFFERENT PERSPECTIVES

Work Control

Quality

Exams Restrictions Impact?

Energy Hazards Controls?

Hazards PPE Controls Risk?

Accidents Hazards Risks?

HazMat Waste Emissions Resources Permits?

Doc   **CE**   **Occ Health**   **Safety**   **Environmental**

The Work is the Same
Why Can't it Be Called the Same

Stewarding Common Data
Once for Use By All

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STEWARDED DATA

Material & MSDS Data

Organization Data

Location Data

Selection Lists

Work Planning

Env

Safety

OH

Quality

Facility

ESOH

SHARED DATA

Shop

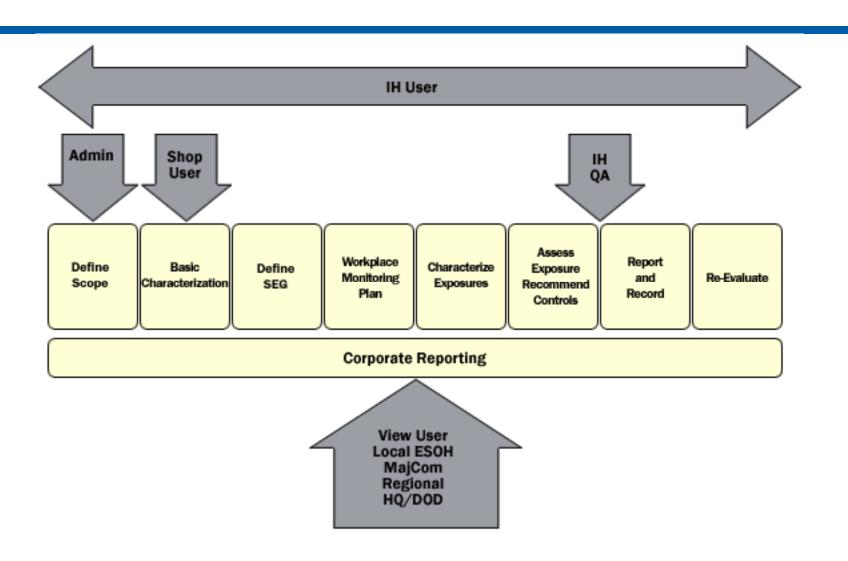Process

Materials

Equipment

Controls

Shop Floor

The More Data Stewarding
The Lower the LifeCycle Cost and the Higher the Quality

Common Business Processes
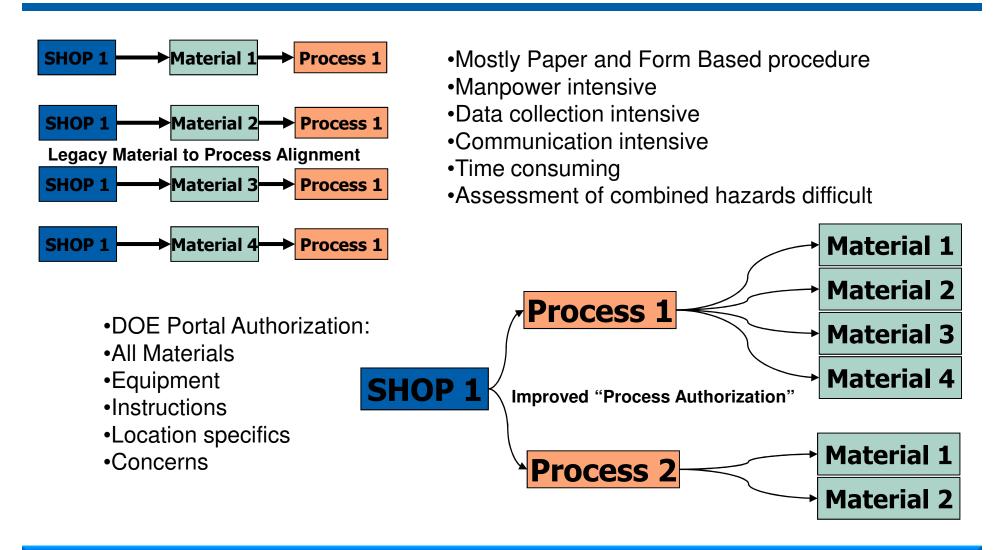
AIHA Exposure Assessment Model
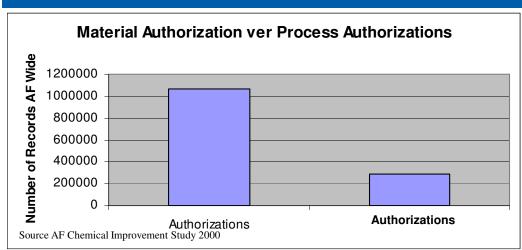Endorsed By Every Federal Component

Authorize Material to Process

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SHOP 1 → Material 1 → Process 1

SHOP 1 → Material 2 → Process 1

Legacy Material to Process Alignment

SHOP 1 → Material 3 → Process 1

SHOP 1 → Material 4 → Process 1

- Mostly Paper and Form Based procedure
- Manpower intensive
- Data collection intensive
- Communication intensive
- Time consuming
- Assessment of combined hazards difficult

- DOE Portal Authorization:
- All Materials
- Equipment
- Instructions
- Location specifics
- Concerns

SHOP 1

Process 1 → Material 1, Material 2, Material 3, Material 4

Improved "Process Authorization"

Process 2 → Material 1, Material 2

Reduce the Number of Approvals,
Increase Hazard Awareness
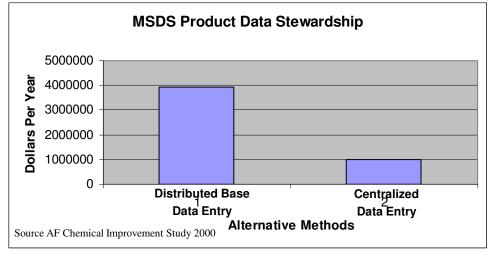
Evaluate Alternative Management Methods

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Material Authorization ver Process Authorizations

Bar chart with y-axis "Number of Records AF Wide" ranging 0 to 1200000, x-axis labeled "Authorizations" and "Authorizations"

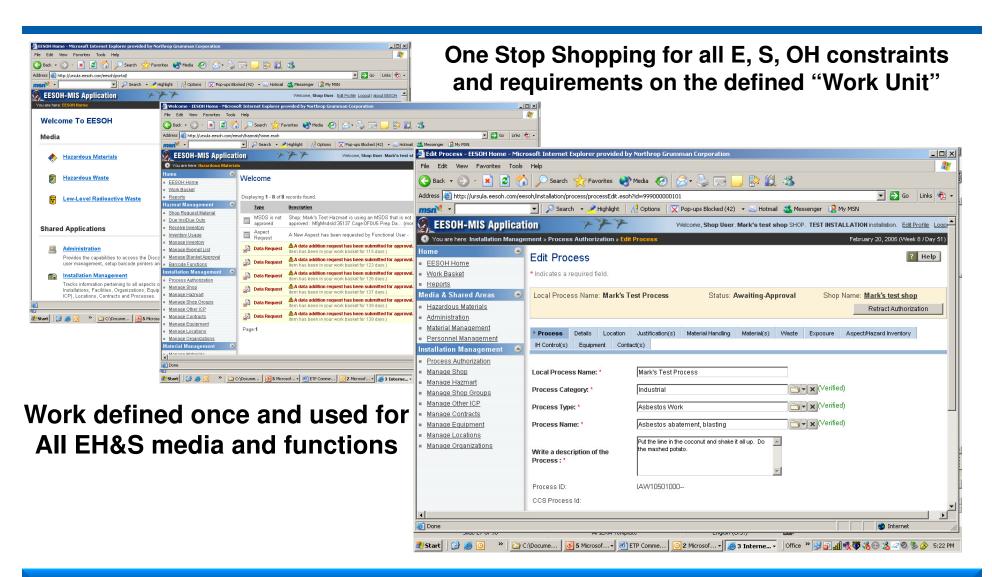Source AF Chemical Improvement Study 2000

- **Identify High Volume Process**
  - **Cycle Time**
  - **Processing Time**
  - **Wait Time**
  - **Impact to Mission**
  - **CTQ and VOC**

- **Investigate Process**
  - **Different Approaches**
  - **Why Do We Do This**
  - **Would It Be Better if..**
  - **How Can We Save Time**
  - **How Can We Improve…**

MSDS Product Data Stewardship

Bar chart with y-axis "Dollars Per Year" ranging 0 to 5000000, x-axis "Alternative Methods" with categories "Distributed Base Data Entry 1" and "Centralized Data Entry 2"

Source AF Chemical Improvement Study 2000

Visualize and Quantify Cost Savings

Single Face to the Shop Floor

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One Stop Shopping for all E, S, OH constraints and requirements on the defined "Work Unit"

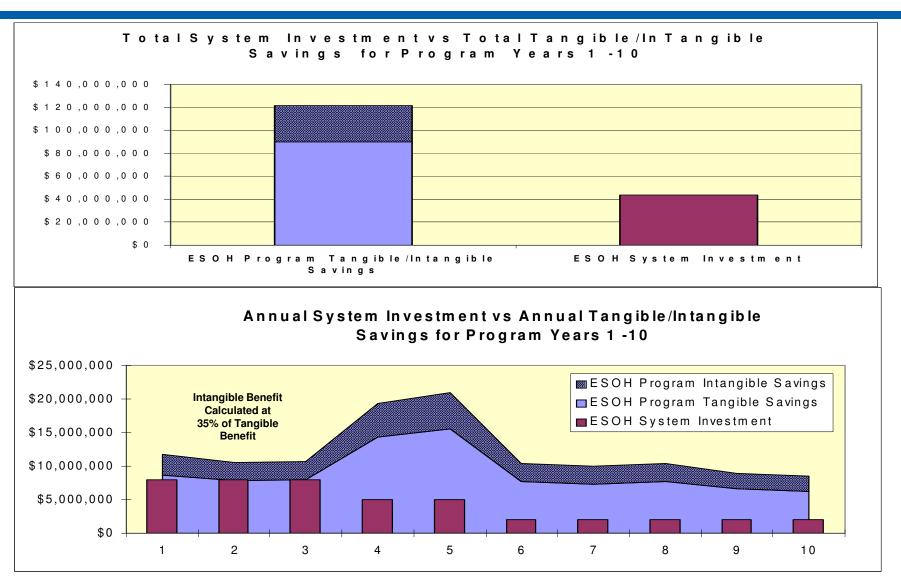**Work defined once and used for All EH&S media and functions**

Work Flow to Eliminate Communication Errors
Most Errors Occur With Manual Processes

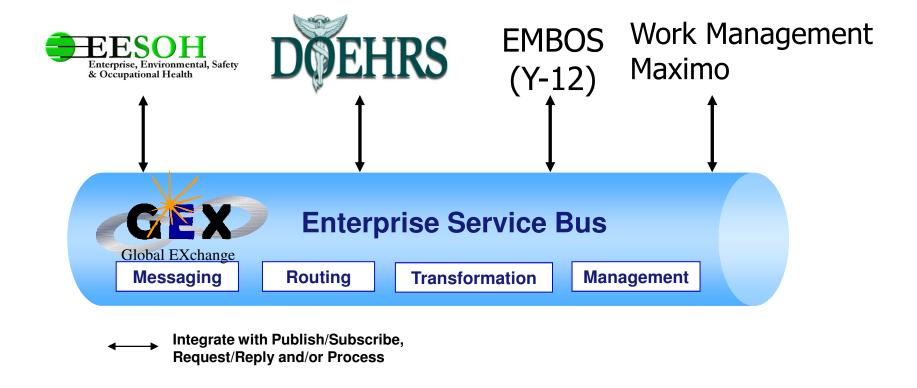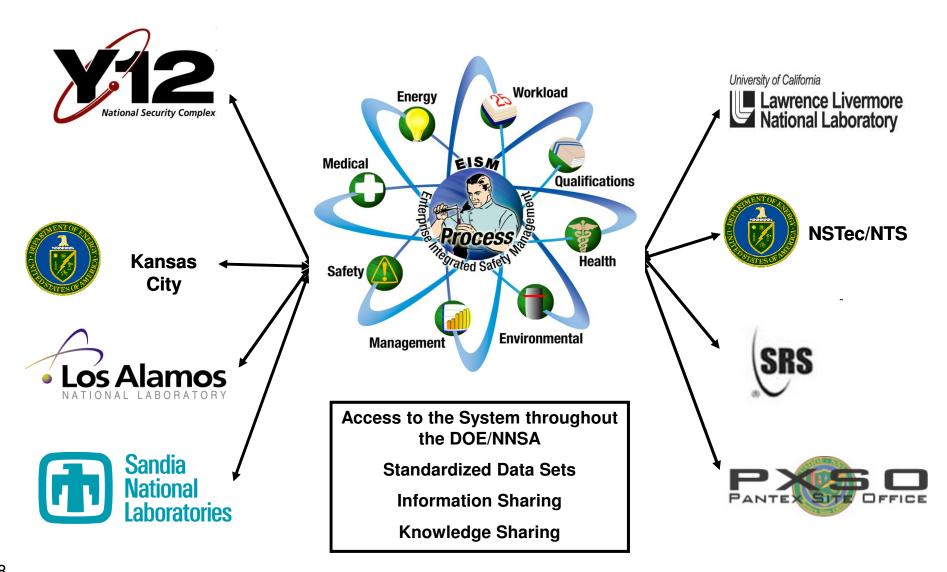# Business Case for EH&S Information System Composite View of Factors Over Life Cycle

Total System Investment vs Total Tangible/Intangible Savings for Program Years 1-10

Annual System Investment vs Annual Tangible/Intangible Savings for Program Years 1-10

Intangible Benefit Calculated at 35% of Tangible Benefit

ESOH Program Intangible Savings
ESOH Program Tangible Savings
ESOH System Investment

EESOH Returns From the Start and Continues To Deliver Value

Using Technology to Integrate the Enterprise

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EESOH
Enterprise, Environmental, Safety & Occupational Health

DOEHRS

EMBOS (Y-12)

Work Management Maximo

GEX
Global EXchange

Enterprise Service Bus

| **Messaging** | **Routing** | **Transformation** | **Management** |

Integrate with Publish/Subscribe, Request/Reply and/or Process

Systems of Systems Approach to Enterprise Integration

To Be: NNSA/DOE EISMS Complex Transformation

Access to the System throughout the DOE/NNSA

Standardized Data Sets

Information Sharing

Knowledge Sharing

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DEFINING THE FUTURE

NNSA

Home

LLNL

Los Alamos

NSTec

Sandia

Y-12

Pantex

NNSA - Integrated Management System
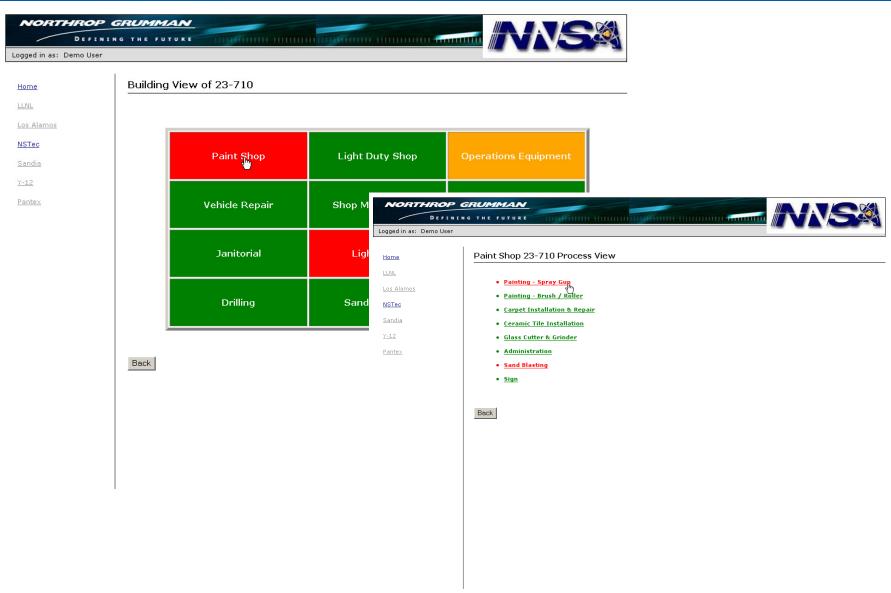
Process Based Collaboration

Process Based Collaboration
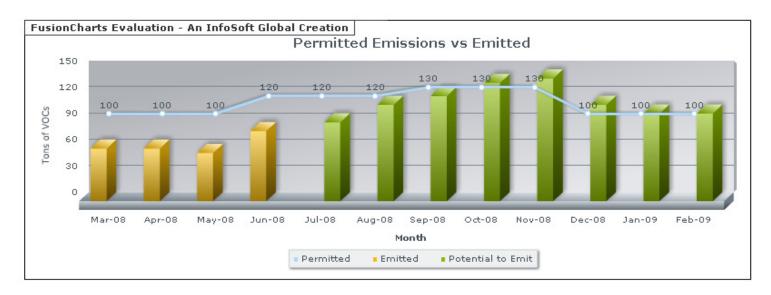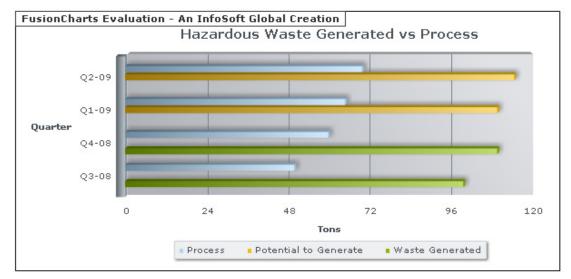
Environmental Dashboard

FusionCharts Evaluation - An InfoSoft Global Creation

Permitted Emissions vs Emitted

Tons of VOCs | Month

Legend: Permitted ■ Emitted ■ Potential to Emit

FusionCharts Evaluation - An InfoSoft Global Creation

Hazardous Waste Generated vs Process

Quarter | Tons

Legend: Process ■ Potential to Generate ■ Waste Generated

Home

LLNL

Los Alamos
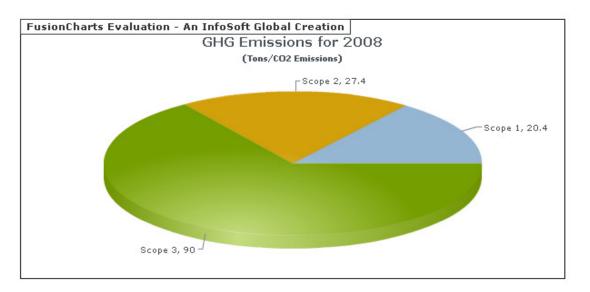
NSTec
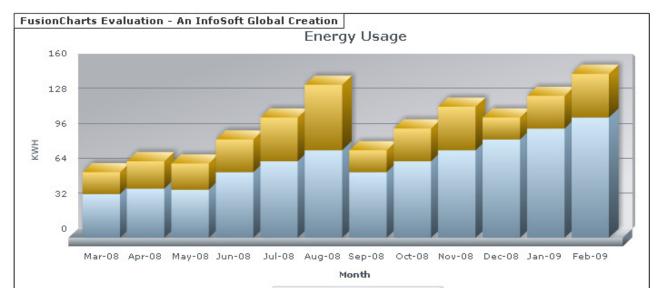
Sandia

Y-12

Pantex

Energy Dashboard

FusionCharts Evaluation - An InfoSoft Global Creation

GHG Emissions for 2008
(Tons/CO2 Emissions)

Scope 2, 27.4

Scope 1, 20.4

Scope 3, 90

FusionCharts Evaluation - An InfoSoft Global Creation

Energy Usage

KWH

160
128
96
64
32
0

Mar-08 Apr-08 May-08 Jun-08 Jul-08 Aug-08 Sep-08 Oct-08 Nov-08 Dec-08 Jan-09 Feb-09

Month

The Road to EISM (Completed)

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- NTS DOEHRS Pilot
  - Validate use of DOD application in DOE site
  - DOEHRS in production at NTS since 2008
  - IH application memorialized in DOE IH manual

- Create EISM Business Case
  - Used DOD and Hill AFB site data to evaluate effects of integrated ESOH
  - Developed Return of Investment model and validated
  - Developed cost estimates for EISM

- Validated EISM Business Case at DOD (Hill AFB)
  - Reviewed metrics with Air Force and validated Business Case
  - Determined variances to DOE implementation
  - Determined measurement metrics for DOE implementation

- Conducted DOE IH Work Shop for EISM (NTS)
  - Explained NNSA direction with EISM
  - Validated need and high level requirements for EISM
  - Began EISM Program documentation

Road to EISM (Completed)

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- Validation of DOEHRS as EISM-EA module
  - Defined DOE required changes to DOEHRS via SRS business process review
  - Reviewed required changes with NTS to verify applicability
  - Submitted changes to DOEHRS program
  - Awaiting DOD formal release of DOEHRS to DOE for modification

- Generation of Critical Decision Package and Enterprise Requirement
  - Worked with NNSA CIO to understand Enterprise Architecture
  - Validated management desire for Enterprise Applications and scope
  - Verified scope as all ISM data that survives M&O contracts
  - Created and submitted CD-0 and CD-1 packages

- Generated Briefings for EFCOG and Management Review
  - Gained acceptance of concept from EFCOG groups and committees
  - NNSA determined to be lead for EISM program

35

Road to EISM, In process

- Implementation of EISM-EA
  - Site installations of EISM-EA at NTS and SRS
  - Validate ability for NNSA and EM to use common application
  - Verify Common Structure for Exposure Records and interoperability
  - Awaiting DOD formal release of DOEHRS to DOE for modification

- Business Process Improvement Pilot (IH and OM)
  - Establish common applications in IH and OM at three sites
  - Requested NTS/SRS/Y-12 participation
  - Identify any Data Gaps and Business Process concerns
  - Verify IH and OM data sets and business process can interoperate

- Business Process Improvement Pilot (Stewarded Data)
  - Gained acceptance of concept from EFCOG groups and committees
  - Requested NTS/SRS/Pantex/Y-12 participation
  - Validate that Chemical Hazard and MSDS data can be reused across sites
  - Verify concept of centralized stewarded data provisioning is possible.

Road to EISM, Future

- Interoperability with Contractor Assurance Systems (CAS)
  – Submitted ISM goals to 5 year strategic plan process
  – Integrating CAS work group and guidance with ISM goals
  – Validating interoperability of "Management Systems"

- Common Work Taxonomy
  – Commonize the definition of work across sites
  – Verify that process centric (work driven) hazard assessment is viable
  – Requesting site participation with scope definition

- Environmental Sampling
  – Establish common sampling and tracking application at multiple sites
  – Validate that sampling performed at sites can be supported by common business process and stewarded data sets
  – Requesting site participation with scope definition

- Establish EISM Governance Board and CCB
  – Establish governance board and CCB for EISM applications
  – Define Governance Change Control structure and scope
  – Current concept is to use the EFCOG committees and structure

BUILD THE BUSINESS CASE

Business Case for EH&S Info. System
Establishing the Baseline Model

- Used environmental, safety and occupational health factors for Hill Air Force Base, an Air Logics Center in the Air Force Materiel Command (AFMC)
  - Hill AFB is a 25,000 employee Air Logistics Center
    - 4 Major Laboratories
    - 4 Major Maintenance Production Facilities
    - 2 Ranges with Active Operations

- Occupational Medicine pillar is for the Hill's Medical Operations
  - 100 Bed Hospital
  - 2 Occupational Medical Clinics

- Budget numbers are from the FY2000 baseline

Environmental Pillar		SOH Pillar		OM Pillar	
Inventory	$4,000,000	Monitoring Samples	$3,000,000	Cost of Medical Services performed	$40,000,000
Waste	$6,000,000	Hours Closing Actions	$4,000,000	Hours away from Work	$7,000,000
Data Collection	$2,000,000	Hours Performing Analysis	$7,000,000	Return to Work Hours	$8,000,000
Reporting	$2,000,000	Hours Away from Work	$4,000,000	Reduction in Workers Compensation	$70,000,000
Permit Acquisition and Taxes	$7,000,000	Employees on Medical Surveillance	$20,000,000	Long Term Disability Compensation	$90,000,000
Environmental Prog. Budget	**$21,000,000**	**SOH Program Budget**	**$38,000,000**	**OM Program Budget**	**$215,000,000**

ESOH Is a Means to Complex Transformation
Eliminate Redundancy, Establish Centers of Excellence

Business Case for EH&S Information System Composite View of Reductions by Factor by Yr.

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Pillars	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-10
Environmental						
Inventory	10%	15%	5%	1%	0%	0%
Waste	10%	15%	5%	1%	0%	0%
Data Collection	10%	10%	2%	1%	0%	0%
Reporting	10%	10%	2%	1%	0%	0%
Permit Acquisition and Taxes	0%	0%	2%	0%	15%	5%
Safety and Occupational Health						
Monitoring Sampling	10%	20%	10%	5%	0%	0%
Hours Closing Actions	10%	20%	5%	5%	2%	0%
Hours Performing Analysis	10%	15%	5%	5%	0%	0%
Hours Away from Work	10%	10%	20%	5%	0%	0%
Employees on Medical Surveillance	0%	0%	2%	5%	5%	5%
Occupational Medicine						
Cost of Medical Services Performed	10%	5%	2%	0%	0%	0%
Hours Away from Work	10%	10%	10%	10%	2%	0%
Return to Work Hours	10%	15%	15%	5%	5%	0%
Reduction in Workers Compensation	0%	0%	5%	10%	15%	5%
Long Term Disability Compensation	0%	0%	0%	5%	5%	5%

- Reductions for Each Pillar Effect Reductions in the Others
  - Process Approval Reduction Not Factored (Not Current Practice)
  - Stewarded Data Not Factored (Not Current Practice)
  - Adding These Two Factors Increases Payback Significantly

Sharing Information, Reduces Cost and Increases Accuracy

Business Case for EH&S Info. System Environmental and Logistics Pillar

- Tangible Savings are measured with the following metrics:
  - Total hazmat Inventory purchased in previous year versus hazmat purchased in current year with monthly rolling totals.
    - Defines the amount of inventory costs saved through better shelf life management and material reuse.
  - Total hazardous waste generated in previous years versus generated in current year with monthly rolling totals.
    - Defines the effect of better hazardous inventory utilization on the generation of hazardous waste.
  - Manpower hours required to produce mandated reports from previous year data versus current year by reports, SARA, RCRA, CERCLA, EPCRA and TSCA.
    - Defines the effect of preserving compliance data online to eliminate the costs associated with gathering data in batch mode to support reporting deadlines.
  - Cycle time of material authorizations from point of need to authorization versus previous authorization method.
    - Defines the efficiency of the system to expedite material requests while decreasing the amount of unauthorized materials.

Metrics Required to Document Value and Fund Program

Business Case for EH&S Info. System Environmental and Logistics Pillar

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- Intangible Benefits are measured with the following metrics:
  - Number of unknown material found in inventory reconciliation by month is an indicator of the effectiveness of hazmat controls and represents risk of being fined for inaccurate reporting.
  - Reduction in lost time injury and accidents indicates the effectiveness of process based authorizations conveying the hazards and controls necessary for safe operations.
  - Ability to produce required reports online indicating the risk of being fined for generating inaccurate reports.
  - Ability to determine hazards associated with infrastructure indicates the risk of having a catastrophic event due to the inaccuracy of emergency response information.
  - Improved processing of emergency plan hazard assessments (EPHAs) and emergency plan reports (EPRs).
  - **EEOICPA, 10CFR850, 10CFR851, DOE O: 151.1C, 440.1B, 450.1, 450.4-1, 451.1B,.......EO 13423,........ .**

Metrics Required to Document Value and Fund Program

Business Case for EH&S Information Systems, Safety Occupational Health Pillar

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- Tangible Savings are measured with the following metrics:
  - Number of lost time accidents from previous year to current year with monthly rolling totals
    - Indicator of systems effectiveness to communicate hazards and safe operations procedures.
  - Number of samples required in work place monitoring to determine hazards from previous year to current year with monthly rolling totals
    - Indicator of systems ability to efficiently define and abate hazards using Similar Exposure Groups (SEGs) to reduce work place sampling
  - Number of work place survey deficiencies recorded per visit
    - Indicator of effectiveness of process authorizations to communicate safe work practices, relates directly to training costs and follow up actions
  - Manpower Required to monitor operations and identify hazards in the work area.
    - Indicator to the effectiveness of flowing data from environmental (E) to safety and occupational health (SOH) and eliminate the need to recreate the same data set.

- Intangible Benefits are measured with the following metrics:
  - Reduction in stop work actions due to unknown or uncontrolled exposure hazards
  - Improved processing of occurrence reports
  - Number of work related illness complaints previous year to current year in rolling monthly totals
  - Work place monitoring requirements measures the risk of OSHA violations
  - Availability of work place hazard assessment measures the risk of litigation expense associated with exposure claims
  - Availability of exposure records to medical practitioners measures the risk of not identifying exposure cases early enough to mitigate legal action.

Metrics Required to Document Value and Fund Program

Business Case for EH&S Information Systems, Occupational Medicine Pillar

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- Tangible Savings are measured with the following metrics:
  - Number of medical surveillance requirements from previous year to current year with monthly rolling totals
    - Indicates the effectiveness of SOH program in reducing demand on medical surveillance
  - Cycle time of medical surveillance visits and number of exams performed per visit
    - Indicates the efficiencies of scheduling and integrated data to reduce time away from work while obtaining required medical attention.
  - Cycle time of return to work orders and/or replacement
    - Indicates the efficiency of the system to identify hazards and determine the means to reduce lost time
  - Number of persons seeking medical attention previous year to current year with monthly rolling totals
    - Indicates the efficiency of the system to reduce medical requirements and effectively reduce workers compensation claims

- Intangible Benefits are measured with the following metrics:
  - Standardized protocols for medical surveillance physicals, qualifications and certifications across the DOE/NNSA complex.
  - Standardized Protocols and the process for return to work across the DOE/NNSA complex.
  - Lays the foundation for establishing a complex-wide exposure registry.
  - Standardize case management practices for both short-term and long-term disability cases.

Metrics Required to Document Value and Fund Program

Summary of Message

- Identify Key Compliance Burdens

- Identify Key Barriers

- Develop methods to overcome barriers

- Identify what you want from an enterprise EH&S application

- Create a business case quantifying the cost/benefit of meeting business objectives

- Address the Low Hanging Fruit

- Establish a budget
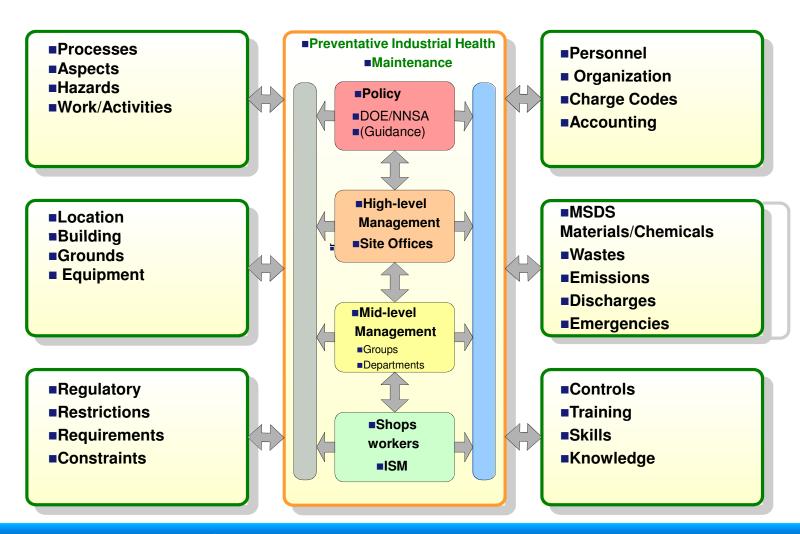 - Money, Money, Money

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Extra Slides

Data Stewardship – Who Really Owns the Data

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Preventative Industrial Health
- Maintenance

- Processes
- Aspects
- Hazards
- Work/Activities

- **Policy**
  - DOE/NNSA
  - (Guidance)

- Personnel
- Organization
- Charge Codes
- Accounting

- Location
- Building
- Grounds
- Equipment

- **High-level Management**
- Site Offices

- MSDS Materials/Chemicals
- Wastes
- Emissions
- Discharges
- Emergencies

- **Mid-level Management**
  - Groups
  - Departments

- Regulatory
- Restrictions
- Requirements
- Constraints

- **Shops workers**
  - ISM

- Controls
- Training
- Skills
- Knowledge

Owning the Data Must also Mean Paying for the Data's Integrity